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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/671,963	09/27/2000	Daoqiang Lu	GTRC40	1376

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EXAMINER

SELLERS, ROBERT E

ART UNIT	PAPER NUMBER
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1712

DATE MAILED: 06/07/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/671,963

Applicant(s)

LU ET AL.

Examiner

Robert Sellers

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 May 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) 6, 8 and 10-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7 and 9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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Claims 10-18 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to non-elected inventions, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 7. Claim 6 is withdrawn as being directed to non-elected species of adhesion promoters since the elected 3-glycidoxypropyltrimethoxysilane is not an ester as defined by the epoxyalkylsilane esters of claim 6, lines 3-4. Claim 8 is withdrawn as requiring non-elected species of carbon-based conductive fillers.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5, 7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okuri et al., Saito et al. Patent No. 5,194,502, Lohse; and Japanese Patent Nos. 60-206882, 60-235877 and 49-97052 in view of Eadara and the article entitled "Enhancement of Underfill Performance for Flip-Chip Applications by Use of Silane Additives" article by Vincent et al.

Okuri et al. (col. 2, lines 31-37 ; col. 3, lines 1-14; col. 5, lines 33-34 and cols. 5-6, Table 1, Urethane modified epoxy resin *2), Saito et al. '502 (col. 2, lines 16-29 and col. 3, lines 8-10 and Table 1, Urethane modified epoxy resin *2), Lohse (col. 1, lines 31-54; col. 3, lines 38-41, the elected species of methylhexahydrophthalic

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anhydride and col. 4, lines 15 and 22) and the Japanese patents (abstracts) show adhesives comprising epoxide-modified polyurethanes derived from the reaction of an isocyanate prepolymer with glycidol (Japanese '052), a monoepoxy alcohol (Lohse) or a hydroxy group(s)-containing epoxy resin, crosslinking agents and conductive fillers.

The claimed adhesion promotor (c) such as the elected species of 3-glycidoxypropyltrimethoxysilane is not recited. Eadara discloses an adhesive component (B) (col. 1, lines 41-51) containing an epoxy-terminated polyurethane (col. 2, lines 51-54), a hardener and an epoxy silane "adhesion promotor which provides the cured adhesive resistance to moisture (col. 2, lines 45-50)." Vincent et al. teaches the addition of an epoxy-functional silane to an epoxy underfill system (page 2, col. 2, last paragraph and page 3, col. 1, last paragraph) to decrease the viscosity, contact angle and flow time and increase the adhesion of the epoxy underfill to the filler.

It would have been obvious to incorporate the epoxy silane adhesion promotor of Eadara and Vincent et al. to the epoxide-modified polyurethane adhesives of Okuri et al., Saito et al. '502, Lohse and the Japanese patents in order to impart moisture resistance (Eadara) as well as decrease the viscosity, contact angle and flow time while increasing the adhesion of the adhesive to the conductive filler (Vincent et al.).

Claims 1, 3-5, 7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al., Japanese Patent No. 50-35232, Soviet Union Patent No. 1,628,508 and Saito et al. Patent No. 4,845,136 in view of Eadara and Vincent et al.

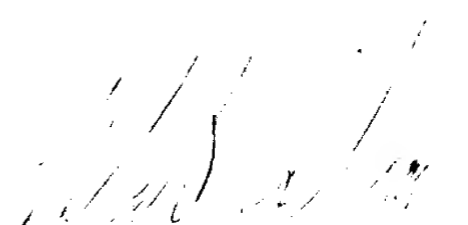
Wang et al. (col. 5, lines 30-44 ; col. 7, lines 12-15 and col. 11, Table 3), the Japanese and Soviet Union patents (abstracts) and Saito et al. '136 (col. 1, lines 21-24, 38-39 and 43-48 and col. 3, lines 40-46) set forth adhesives prepared from epoxide-modified polyurethanes obtained from the reaction of an epoxy resin and an isocyanate prepolymer, crosslinking agents and conductive fillers.

The claimed adhesion promotor (c) such as the elected species of 3-glycidoxypropyltrimethoxysilane is not recited. It would have been obvious to incorporate the epoxy silane adhesion promotor of Eadara and Vincent et al. to the epoxide-modified polyurethane adhesives of Wang et al., the Japanese and Soviet Union patents and Saito et al. '136 in order to impart moisture resistance (Eadara) as well as decrease the viscosity, contact angle and flow time while increasing the adhesion of the adhesive to the conductive filler (Vincent et al.).

Claim 2 defining an epoxide-modified polyurethane having a structure wherein the epoxy groups are attached to the isocyanate prepolymer repeating unit via the reaction of the hydroxyl group pendant on the epoxy reactant is not recited. Wang et al., the Japanese and Soviet Union patents and Saito et al. '136 react the isocyanate prepolymer with the epoxy resin through the epoxy groups, thereby conforming to the generic epoxide-modified polyurethane of claim 1 but not the particular structure of claim 2.

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RS 6/5/02



ROBERT E.L. SELLERS
PRIMARY EXAMINER